

Applicant : Neal A. Brown  
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Attorney's Docket No.: 10431-005001

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-8. (Cancelled)

9. (previously presented) A marine riser, comprising:

(a) a riser pipe having an outer riser pipe surface;

(b) an annular sheath surrounding the riser pipe and forming a conduit between the outer riser pipe surface and an inner surface of the annular sheath, the annular sheath having an outer surface;

(c) at least one pair of nozzles for discharging water carried by the conduit out of the annular sheath in a direction substantially tangential to the outer surface of the annular sheath;

(d) when the marine riser is beset by a current, the discharge of water by the at least one pair of nozzles substantially preventing flow separation of the current on a down-current side of the marine riser and thereby substantially preventing hydrodynamic drag and vortex induced vibration (VIV) that the marine riser would experience in the absence of the discharge of water by the at least one pair of nozzles; and

a system for pumping water through the conduit to at least one of the pair of nozzles,

wherein the system for rotating the annular sheath includes a gear for rotating the annular sheath and the at least one pair of nozzles relative to the riser pipe and a gear motor for driving the gear,

wherein the system for rotating the annular sheath further includes a ring gear supported by a bulkhead surrounding the riser pipe and at least one pinion gear for engaging the ring gear,

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wherein the annular sheath includes an inner tube surrounding the riser pipe and an outer tube surrounding the inner tube, wherein a region is formed between the riser pipe and the inner tube, the region containing buoyancy material, and wherein the system for rotating the annular sheath is for rotating the outer tube, the inner tube, and the at least one pair of nozzles relative to the riser pipe.

10-25. (Cancelled)

26. (previously presented) A marine riser, comprising:

(a) a riser pipe having an outer riser pipe surface;

(b) a telescoping annular sheath surrounding the riser pipe and forming a conduit between the outer riser pipe surface and an inner surface of the telescoping annular sheath, the telescoping annular sheath including:

(1) a first cylindrical section; and

(2) a second cylindrical section that can be substantially inserted in and substantially extended from the first cylindrical section;

(c) at least one pair of nozzles extending through at least one of the first and second cylindrical sections of the telescoping annular sheath for discharging water carried by the conduit out of the telescoping annular sheath in a direction substantially tangential to the outer surface of the telescoping annular sheath; and

(d) when the marine riser is beset by a current, the discharge of water by the at least one pair of nozzles substantially preventing flow separation of the current on a down-current side of the marine riser and thereby substantially preventing hydrodynamic drag and vortex induced vibration (VIV) that the marine riser would experience in the absence of the discharge of water by the at least one pair of nozzles;

wherein the second cylindrical section includes a seal for engaging the riser pipe and for substantially preventing water from escaping the conduit.

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27. (previously presented) A marine riser, comprising:

- (a) a riser pipe having an outer riser pipe surface;
- (b) a telescoping annular sheath surrounding the riser pipe and forming a conduit between the outer riser pipe surface and an inner surface of the telescoping annular sheath, the telescoping annular sheath including:
  - (1) a first cylindrical section; and
  - (2) a second cylindrical section that can be substantially inserted in and substantially extended from the first cylindrical section;
- (c) at least one pair of nozzles extending through at least one of the first and second cylindrical sections of the telescoping annular sheath for discharging water carried by the conduit out of the telescoping annular sheath in a direction substantially tangential to the outer surface of the telescoping annular sheath; and
- (d) when the marine riser is beset by a current, the discharge of water by the at least one pair of nozzles substantially preventing flow separation of the current on a down-current side of the marine riser and thereby substantially preventing hydrodynamic drag and vortex induced vibration (VIV) that the marine riser would experience in the absence of the discharge of water by the at least one pair of nozzles,

wherein the second cylindrical section includes a seal for engaging the riser pipe and for substantially preventing water from escaping the conduit, wherein the riser pipe is surrounded at least in part by at least one annular buoyancy ring, and wherein the seal comprises an inflatable toroidal ring that is controllably inflatable and deflatable to engage each buoyancy ring.

28-32. (Cancelled)

33. (previously presented) A marine riser, comprising:

- (a) a riser pipe having an outer riser pipe surface;

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(b) a telescoping annular sheath surrounding the riser pipe and forming a conduit between the outer riser pipe surface and an inner surface of the telescoping annular sheath, the telescoping annular sheath including:

- (1) a first cylindrical section, and
- (2) a second cylindrical section that can be substantially inserted in and substantially extended from the first cylindrical section;

(c) at least one pair of nozzles extending through at least one of the first and second cylindrical sections of the telescoping annular sheath for discharging water carried by the conduit out of the telescoping annular sheath in a direction substantially tangential to the outer surface of the telescoping annular sheath;

(d) when the marine riser is beset by a current, the discharge of water by the at least one pair of nozzles substantially preventing flow separation of the current on a down-current side of the marine riser and thereby substantially preventing hydrodynamic drag and vortex induced vibration (VIV) that the marine riser would experience in the absence of the discharge of water by the at least one pair of nozzles; and

(e) at least one cable extending from an upper terminus of the marine riser to a bottom terminus of the second cylindrical section for reducing loss of discharge water during retraction of the telescoping annular sheath.

34-49. (Cancelled)